IN THE UNITED STATES PATENT AND TRADEMARK OFFICE		
	Application Number	08/386,813
	Filing Date	February 8, 1995
	First Named Inventor	Boris HÖGLUND
	Group Art Unit	1772 # 14
	Examiner Name	HON, Sow Fun KW
	Attorney Docket Number	2530-107 8-9-02
Title of the Invention:	TUBING USED FOR ENCASING FOOD PRODUCTS AND A METHOD FOR MANUFACTURING THE TUBING	

DECLARATION UNDER 37 C.F.R. § 1.132 OF EDMUND KING

I, Edmund King, hereby declare as follows:

1. I am an inventor of the subject matter of this patent application.

2. I have a graduate degree in chemistry, and I have over 45 years of experience as a chemist involved in the development and manufacture of coated paper and cellulose materials.

3. I have reviewed the Office Action of December 5, 2001 as well as the cited patents Nicholson, (5,227,857), O'Brien (3,645,760) and Hammer (5,143,584). It is my understanding that Nicholson '857 and Hammer '584 do not actually constitute prior art as against the claims of this pending application. Nevertheless, the purpose of this declaration is to demonstrate, by the submission of comparison data, the superior strength and elasticity of a casing manufactured in accordance with the present invention over casings made according to the methods described in the cited patents, and to explain the advantages provided by the superior strength and elasticity. Another purpose of this declaration is to explain how certain subject matter claimed in this application is supported by the disclosure of an earlier priority document.

4. In paragraphs 8 and 9 on page 5 of the Office Action, Applicant is requested to demonstrate the criticality of the strength and elasticity of the claimed casing over the prior art.

5. The Examiner's attention is respectfully drawn to Table 2 of the present application. In said Table, burst coefficients have been calculated for casings having diameters from 45 to 80 mm using, as wet strength additives, viscose and polyamide epichlorohydrin resin. The burst strength is calculated as follows:

$$BC = SQ \cdot d \cdot \pi/100$$

wherein: BC = burst coefficient

SQ = strength quotient = b/w

b = burst strength, kPa

w = paper base weight, g/m^2

d = casing diameter, mm

$\pi = 3.1416\ldots$

The BC values (burst strengths) of casings according to the claimed invention are given in Table 2 of the present application. They vary between 8.5 and 11.1, the average being 9.7.

6. In Examples 1 to 3 of Hammer, the BC values (burst strengths) are as follows:

Example	b, kPA	w, g/m^2	SQ = b/w	d, mm	$BC = SQ \cdot d \cdot \pi/100$
1	76	21.0	3.619	75	8.5
2	79	23.7	3.333	90	9.4
3	60	25.4	2.362	120	8.9

The BC values (burst strengths) of Hammer vary between 8.5 and 9.4, the average being 8.9.

7. Thus, the burst coefficients of casings according to the present invention are at least on the same level as those of Hammer's casings, their mean value being about 10 % higher.

8. Hammer explains that fiber-reinforced cellulose films produced by the viscose process have inferior strength and tend to burst even under a relatively low internal pressure. (*See* Hammer '584, col. 1, l. 56 - col. 2, l. 2). O'Brien '760 describes just such a viscose process for forming fiber-reinforced cellulose films. Thus, I conclude that casing formed by the process described in O'Brien '760 have inferior strength as compared to casing formed by the process

described in Hammer '584.

9. Consequently, the early casings, as taught by O'Brien, are inferior to the casings of both Hammer and the present application with respect to the strength of the casings. Moreover, as demonstrated above, the casings of the present claims have at least the strength of Hammer's casings.

10. In paragraph 9 of the Office Action, the Examiner requests that Applicant demonstrate the criticality of the claimed elastic range as directed to the presently claimed invention over the prior art.

11. The Examiner's attention is respectfully drawn to Table 1 of the present application. In said Table, casing elasticity results when using a 0 to 30 kPa inflation are given. By casing elasticity (= CE) is meant the percentage of <u>reversible</u> casing diameter stretch when inflating by a pressure starting from 0 kPa and ending at 30 kPa. The CE of casings according to the present invention vary between 13.2 % and 19.2 %, the average being 16.4 %.

12. In Hammer's Examples, the static stretches at 21 kPa have been measured for the casings. A value, which is comparable to the CE values given in Table 1 of the present application, is obtained by means of the following formula:

CE = (static stretch value - nominal tube diameter)/nominal tube diameter · 100 %

For examples 1 to 3 of Hammer, the CE values are as follows:

Example	Static Stretch Value, mm	Nom. Tube Dia., mm	CE, %
1	28	75	9.3
2	100	90	11.1
3	135	120	12.5

13. Thus, the casing elasticity values CE of Hammer's Examples are between 9.3 and 12.5 %, the average being about 11 %. The CE values of the claimed casings are about 50 % higher than those of Hammer's casings.

14. The elasticity of the invention and Hammer can also be compared by calculating the elasticity as the reversible expansion in mm per unit of stuffing pressure in kPa. In order to obtain reliable results, casing samples of equal or nearly equal parameter must be compared.

15. The attention of the Examiner is kindly drawn to the viscose casings disclosed in the five last lines of Table 1 of the present application. The diameters of the casings are 70 or 80 mm. In Hammer's Example 1, a comparable casing having a diameter of 75 is disclosed. The other Examples of Hammer use considerably larger diameters and are not comparable.

16. For the first of said five casings disclosed in Table 1, having a diameter of 70 mm, the elasticity is 19.2 % when using a pressure of 30 kPa. The corresponding expansion is $19.2\%/100\% \cdot 70\text{ mm} = 13.44\text{ mm}$. The elasticity expressed as expansion per pressure is then $13.44\text{ mm} / 30\text{ kPa} = 0.45\text{ mm/kPa}$. By carrying out the same calculations for the remaining 4 casings at the bottom of the Table, the following values are obtained:

Table 1 with recalculated elasticity for casing diameters between 70 and 80 mm.

Casing Size Diameter (mm) / Paper Bonding Type	Substrate Paper Basis Weight (Base Paper Weight), g/m	Casing Elasticity at 30 kPa, mm/kPa
70 / Viscose	14.9	0.45
70 / Resin(s)	12.4	0.43
80 / Viscose	15.4	0.49
80 / Resin(s)	12.7	0.48
80 / Resin(s)	15.0	0.42

17. Next, the Examiner's attention is drawn to Example 1 of Hammer. The diameter of the initial casing is 75 mm, i.e. of the same magnitude as the above five diameters. Hammer gives the expanded and the unexpanded casing diameters, whereby their difference (in mm) forms said expansion. Hammer uses the stuffing pressure 21 kPa. The starting values and the elasticity expressed as expansion per stuffing pressure are then as follows:

Example 1 (base paper weight 21 g/m^2): (82 – 75) mm / 21 kPa = 0.33 mm/kPa

Said five last elasticities of Table 1 expressed as expansion per pressure were between 0.42 and 0.49 mm/kPa, the mean value being 0.45 mm/kPa. The corresponding elasticity of Hammer's Example 1 was 0.33 mm/kPa. Thus, the elasticity expressed as expansion per pressure of the claimed casings is about 36 % higher than the elasticity of Hammer's casing.

18. Above, it was shown that the bursting strength of the claimed casings was 10 % higher than that of Hammer. Further, it was shown, that the elasticity was, depending on the method of calculation, from 35 to 50 % better than that of Hammer. Hammer uses a 65 % thicker base paper (21 g/m^2 vs. 12.4-15.4 g/m^2) with an alginate superimpregnate and still obtains less elastic casings.

19. The superior elasticity, achieved with the process of the present invention using thinner paper than was used by Hammer, results in superior sausage casings. Casings formed in accordance with the method of the present invention can be filled to a greater internal pressure than can casings formed by prior art methods, while still maintaining the casing elasticity. This results in heavier, more dense sausages. Moreover, maintaining the elasticity of the casing on the formed sausage is very important to consumer acceptance. If the casing, in the process of being filled to form a sausage, is stretched beyond its elastic limit, the casing will not fit snugly on the sausage and will not present a smooth, wrinkle-free external surface that is important to customer acceptance of the sausage product.

20. The present application claims priority on the earlier Finnish application 896229, filed on Dec. 22, 1989. On p. 2, l. 4-7, of the English translation of said application, a fiber paper impregnated with viscose is disclosed. According to page 1, l. 25, as well as claim 1, of said

translation, the fiber paper has a weight no more than 15 g/m^2. Moreover, it was generally known in the art at the time of filing the earlier priority application that the fiber structure of the paper no longer holds together at weights below about 10 g/m^2. Thus, the presently claimed weight range of 10-15 g/m^2 finds support in the earlier Finnish application 896229.

The foregoing statements are, to the best of my knowledge, true and correct. I acknowledge that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. § 1001) and may jeopardize the validity of this application or any patent issuing thereon.

2nd July 2002
Date

Edmund King

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